

Knowledge, Attitudes, and Practices Toward Family Planning among Women of Reproductive Age in Bor South County, Jonglei State, South Sudan: A Descriptive Cross-Sectional Study

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Abstract

Implementing family planning is crucial for enhancing maternal and child health outcomes, especially in regions with limited healthcare access like South Sudan. This descriptive cross-sectional study, conducted from January to March 2024, assessed the knowledge, attitudes, and practices (KAP) related to family planning among 288 women aged 15-49 in Bor South County, Jonglei State. Participants were selected using a simple random sampling technique, and data were collected through structured questionnaires using the Kobo Collect Tool. The analysis, performed using SPSS version 26.0, found significant gaps in knowledge about family planning methods, with the highest awareness reported for condoms (27.4%) and oral contraceptive pills (17.7%). The Pearson chi-square test revealed a significant association between age and knowledge of family planning methods ($p = 0.00$). Additionally, socio-demographic factors such as age, marital status, and education level significantly influenced attitudes towards family planning ($p = 0.042$, $p = 0.026$, and $p = 0.000$, respectively). Utilization of family planning services was significantly associated with education level ($p = 0.000$) and religion ($p = 0.004$), indicating socio-demographic barriers that impact service use. The findings underscore the need for targeted educational and outreach programs to improve family planning knowledge and attitudes. Addressing socio-demographic barriers and enhancing community engagement is critical for increasing the utilization of family planning services in Bor South County.

Keywords: Educational Interventions, Family Planning, Maternal and Child Health, Reproductive Health, Socio-demographic Factors, Socio-Cultural Dynamics, South Sudan.

Introduction

Family planning is a crucial component of public health strategies aimed at improving maternal and child health outcomes, particularly in regions with limited access to healthcare, such as South Sudan. The maternal mortality ratio in South Sudan, which stands at 789 deaths per 100,000 live births, underscores the urgent need for effective family planning interventions [16]. Effective family planning has the potential to significantly reduce maternal and infant mortality rates, prevent

unplanned pregnancies, and empower women to make informed decisions about their reproductive health. However, despite these benefits, family planning services remain underutilized in many parts of the world due to various socio-cultural, economic, and educational barriers [1, 2].

In South Sudan, the socio-cultural context presents additional challenges to the uptake of family planning services. Patriarchal norms and traditional practices often restrict women's autonomy in making reproductive decisions,

limiting their access to family planning services [16, 17]. Similar socio-cultural barriers have been observed in other regions, such as among the Juang tribe in Odisha, India, where cultural attitudes and determinants significantly influence contraceptive use [6]. These findings suggest that understanding the socio-cultural dynamics of specific communities is essential for designing effective family planning interventions.

The literature on family planning and health practices reveals significant gaps in knowledge, attitudes, and practices (KAP) across different populations and regions. For example, Abebaw et al. (2022) conducted a study among female healthcare providers in Northwest Ethiopia, revealing substantial gaps in their knowledge and practices towards cervical cancer screening, underscoring the need for targeted training programs [1]. Similarly, research by Aladenola et al. in Nigeria demonstrated that community pharmacists' participation in family planning services significantly improved following training interventions, indicating the potential effectiveness of similar educational programs in other contexts [2].

Further studies highlight the pervasive nature of gaps in KAP not only in family planning but also in other health-related areas. Vasconcelos et al. systematically reviewed the knowledge, attitudes, and practices related to pessaries for pelvic organ prolapse among women and healthcare providers, identifying a need for better educational interventions [3]. In Thailand, the KAP towards swine influenza among pig farm stakeholders, recommends community-based health education to address significant gaps [4]. Additionally, research on Rural Unqualified Health Practitioners (RUHPs) in West Bengal, India, by Debsarma highlighted substandard KAP scores, emphasizing the necessity for targeted interventions like app-based learning [5].

Educational strategies have been shown to have a positive impact on KAP in various contexts. Sharifzadeh and Abdollahzadeh

studied the effects of different education strategies on rice farmers' KAP about pesticide use in Iran, demonstrating the importance of tailored educational approaches [10]. Similarly, Waithanji et al. explored gendered knowledge, attitudes, and practices among poultry and pond fish farmers in Kenya regarding the use of insects as feed, highlighting the intersection of agriculture and health education [13].

Research on infectious diseases further illustrates the critical need for effective KAP strategies. Alghazali et al. conducted a study in Yemen during the 2016 war [8], finding significant gaps in KAP regarding dengue fever among febrile patients, which were exacerbated by the conflict. Rahman et al. investigated KAP related to climate change and dengue in Laos and Thailand [7], emphasizing the importance of integrating public health education with broader environmental awareness initiatives. The COVID-19 pandemic has also underscored the importance of KAP studies. Sarria-Guzmán et al. (2021) conducted a systematic review of KAP during the COVID-19 pandemic in the Americas [14], identifying critical gaps that need to be addressed to improve public health responses. The objective is to evaluate the KAP related to family planning among women of reproductive age in Bor South County, South Sudan. This study also identifies gaps and barriers to family planning and informs the development of effective interventions to improve the region's maternal and child health outcomes.

Despite the contributions of these studies, a significant research gap remains in understanding how socio-cultural barriers specifically impact KAP related to family planning in rural, conflict-affected areas like Bor South County, South Sudan. Most existing research has focused on urban settings, where the dynamics of family planning are influenced by factors such as education level, marital status, and access to healthcare infrastructure [15]. However, findings from urban studies may not fully capture the additional barriers

present in rural areas, where stronger adherence to traditional practices and limited healthcare infrastructure create unique challenges.

This study aims to fill this gap by evaluating the KAP related to family planning among women of reproductive age in Bor South County. By focusing on a rural, conflict-affected area, this study seeks to provide insights into the unique challenges and opportunities for improving family planning services in similar settings. The study builds on the findings of previous research but focuses specifically on the socio-cultural dynamics of Bor South County, which have been underexplored in the literature.

The objectives of this study are to evaluate the KAP related to family planning among women of reproductive age in Bor South County and to identify the socio-demographic factors influencing these practices. These objectives are directly tied to the identified research gap, aiming to provide a clearer understanding of how socio-cultural factors shape family planning behaviours in this specific context. By addressing the specific gaps identified in previous research and focusing on the unique context of Bor South County, this study aims to contribute to the existing body of knowledge on family planning in conflict-affected regions of Africa.

Methodology

Study Design

A descriptive cross-sectional study was conducted to assess the knowledge, attitudes, and practices (KAP) related to family planning among women of reproductive age in Bor South County, Jonglei State, South Sudan. The cross-sectional design was chosen because it provides a comprehensive overview of the current KAP levels within the population at a specific point in time, allowing for the identification of associations between socio-demographic factors and KAP. This design was preferred over longitudinal studies due to the immediate need for data to inform targeted interventions

and the practical limitations of conducting long-term studies in a resource-limited setting.

Study Area

This study was carried out in Bor South County, Jonglei State, South Sudan, an area selected due to its restricted healthcare availability and the critical need for improved family planning services. The rural and conflict-affected nature of Bor South County provides a unique context for understanding the socio-cultural and economic barriers to family planning, which are central to the study's objectives.

Study Population

The target population comprised women aged 15 to 49 residing in Bor South County. This age group was specifically chosen as it includes women of reproductive age, who are most relevant to the study's focus on family planning. The objective of evaluating KAP among this demographic is directly tied to understanding the factors that influence family planning behaviours in this population.

Sample Size Determination

A simple random sampling technique was used to select a sample of 288 women. The sample size was determined based on existing literature and the expected prevalence of family planning knowledge and use in similar settings, assuming a prevalence rate, margin of error of 5%, and a confidence level of 95%. This approach ensured that the sample was representative of the broader population, allowing for generalization of the findings. The sample size calculation was validated by comparing it with sample sizes used in similar studies to ensure its appropriateness for the study's context and objectives.

Sampling Procedure

Participants were selected using simple random sampling, which involved generating a random list of eligible women from local health records. This method minimized selection bias

and enhanced the representativeness of the sample. However, potential limitations, such as selection bias or non-response, were acknowledged and mitigated by ensuring that the sample size was sufficiently large and diverse.

Ethical Considerations

Ethical approval was obtained from relevant authorities, and informed consent was secured from all participants. Confidentiality was maintained by anonymizing responses and securely storing information. Participants were informed of their right to withdraw from the study at any time, ensuring voluntary and informed participation. Additionally, sensitive information was handled with care to ensure participants' comfort and safety.

Hypotheses

The study objectives, as well as the introduction, lead to the formulation of the following hypotheses,

(i) Knowledge of Methods of Family Planning

- H0: There are no statistically significant gaps in the knowledge of family planning methods among women of reproductive age group in Bor South County, located in South Sudan.
- H1: Women of reproductive age in Bor South County, South Sudan, understand family planning services only partially.

(ii) Attitudes Towards Family Planning

- H0: Socio-demographic factors like age, marital status, and education level do not influence attitudes toward family planning among women of reproductive age in Bor South County.
- H1: In Bor South County, women's attitudes toward family planning are shaped by socio-demographic factors including age, marital status, and education level.

(iii) Utilization of Family Planning Services

- H0: Socio-demographic barriers do not significantly impact the utilization of available family planning services.
- H1: Socio-demographic barriers significantly impact the use of accessible family planning services.

Data Collection

Data were collected using structured questionnaires administered via the Kobo Collect Tool by trained interviewers. The questionnaire, pre-tested for clarity and reliability, covered socio-demographic characteristics, family planning knowledge, attitudes, and practices. Structured questionnaires were chosen for their ability to provide consistent data across the study population and to facilitate straightforward analysis. To mitigate potential biases like social desirability, the questionnaire design and interviewer training were carefully conducted.

Data Analysis

Data were analyzed using SPSS version 26.0. Descriptive statistics summarized socio-demographic characteristics and KAP variables. Chi-square tests explored associations between categorical variables, and logistic regression identified predictors of family planning knowledge, attitudes, and practices. Normality checks were performed on continuous variables to validate the use of appropriate statistical tests. Missing data were handled using appropriate methods to ensure the robustness of the analysis. The results were interpreted in line with the study's objectives, focusing on the socio-demographic factors impacting family planning behaviours in Bor South County.

Analysis and Results

Distribution of Respondents by Administrative Division

Table 1. Distribution of Respondents by Administrative Division

Administrative Division		Frequency (288)	Percent
State	Jonglei State	288	100.0
County	Bor South	288	100.0
Payam	Anyidi	48	16.7
	Bandit	48	16.7
	Bor Town	48	16.7
	Jalle	48	16.7
	Kolnyang	48	16.7
	Makuach	48	16.7

Table 1 shows the distribution of respondents across different administrative divisions. All respondents (288) are from Jonglei State, Bor South County, which is further subdivided into six Payams (Anyidi,

Bandit, Bor Town, Jalle, Kolnyang, and Makuach) with an equal frequency of 48 each, representing 16.7% per Payam.

Knowledge of Family Planning Methods

Table 2. Knowledge of Family Planning Methods by Age Group

Family Planning Method	15-21 Years	22-28 Years	29-35 Years	36-42 Years	43-49 Years	Total
Condom	10	34	25	8	2	79
Implant	0	1	1	0	0	2
Injectable	4	7	7	4	2	24
Lactation Amenorrhoea	1	0	0	1	0	2
Oral Contraceptive Pill	15	14	16	4	2	51
Total	47	103	79	31	28	288
Pearson chi-square = 1.244, p-value = 0.00						

Table 2 illustrates the knowledge of family planning methods across different age groups. The Pearson chi-square value of 1.244 with a p-value of 0.00 indicates a significant relationship

between age and knowledge of methods of family planning.

1. *Condoms* are the most recognized method known by 79 respondents with the highest

awareness among the 22-28 years age group (34 respondents).

2. *Oral contraceptive pills* are also widely known (51 respondents), particularly among those aged 15-21 and 29-35.
3. *Injectables* are known to 24 respondents with a fairly even distribution across age groups.
4. *Implants* and *lactation amenorrhoea* have minimal recognition, each known by only 2 respondents.

Results of Hypothesis Test

- H0: There are no statistically significant gaps in the knowledge of

methods of family planning among women of reproductive age group in Bor South County, located in South Sudan.

- H1: Women of reproductive age in Bor South County, South Sudan, understand family planning services only partially.

From Table 2, with a p-value of 0.00, H0 is rejected, and H1 is accepted, concluding that there exists a significant gap in the knowledge of family planning techniques across various age groups.

Attitudes Towards Family Planning

Table 3. Associations between Sociodemographic Variables and Attitudes/Perceptions in Family Planning

Chi-Square Test Comparison	Pearson Chi-Square	Likelihood Ratio	p-value
Methods Known vs. Age	32.110	32.450	0.042
Reasons for using vs. Age	35.673	35.068	0.003
Training on family planning vs. Number of children (parity)	17.490	19.180	0.008
Training on family planning vs. Stay in town or village	18.996	19.606	0.000
Training on family planning vs. Occupation	41.575	38.652	0.000
Opinion on Family Planning vs. Marital Status	14.360	14.312	0.026
Opinion on family planning vs. educational level	21.089	23.309	0.000
Encouraging others vs. Number of children (parity)	13.289	13.233	0.039
Encouraging others vs. Occupation	31.990	33.508	0.000

Table 3 presents the associations between various sociodemographic variables and attitudes toward family planning, with significant p-values indicating meaningful associations.

1. *Methods known and Age*: Significant association (p=0.042).
2. *Reasons for using and Age*: Highly significant (p=0.003).

3. *Training on family planning and Number of children (parity)*: Significant (p=0.008).
4. *Training on family planning and. Stay in town or village*: Highly significant (p=0.000).
5. *Training on family planning and Occupation*: Highly significant (p=0.000).
6. *Opinion on family planning and Marital Status*: Significant (p=0.026).

- 7. *Opinion on family planning and Educational level*: Highly significant (p=0.000).
- 8. *Encouraging others and Number of children (parity)*: Significant (p=0.039).
- 9. *Encouraging others and Occupation*: Highly significant (p=0.000).

- H1: Attitudes towards family planning among women of reproductive age in Bor South County are influenced by socio-demographic characteristics such as age, marital status, and education level.

Results of Hypothesis Test

- H0: There is no influence of socio-demographic factors like age, marital status, and education level on the attitudes toward family planning among the women of reproductive age in Bor South County.

Given the significant p-values, the null hypothesis H0 is rejected, and the alternative hypothesis H1 is accepted. This suggests that socio-demographic factors such as age, education level, marital status, occupation, and place of residence significantly impact attitudes towards family planning.

Utilization of Family Planning Services

Table 4. Utilization of Family Planning Services by Ethnicity, Religion, and Education Level

	Have you ever used family planning services?				p-value
	No Response	No	Yes	Total	
Ethnicity					0.266**
Anyuak	0	2	3	5	
Dinka	122	67	76	265	
Nuer	8	3	4	15	
Other	0	1	2	3	
Religion					0.004*
	130	73	85	288	
Christianity	129	73	79	281	
Muslim	1	0	6	7	
Total	130	73	85	288	
College/University					0.000*
	0	2	13	15	
No Education	95	26	17	138	
Primary	29	28	40	97	
Secondary	6	17	15	38	
Total	130	73	85	288	

Table 4 examines the utilization of family planning services by ethnicity, religion, and education level, with p-values indicating the significance of associations.

1. *Ethnicity*: Not significantly associated with utilization (p=0.266).
2. *Religion*: Significantly associated with utilization (p=0.004), with Christianity having more users.

3. *Education level*: Strongly associated with utilization ($p=0.000$), with higher education levels correlating with higher usage.

Results of the Hypothesis Test

- H0: Socio-demographic barriers do not significantly hinder the utilization of available family planning services.
- H1: Socio-demographic barriers significantly hinder the utilization of available family planning services.

Based on the significant p-values associated with religion and education, the null hypothesis H0 is rejected, and H1 is accepted, concluding that socio-demographic barriers, specifically religion and education level, substantially impact the use of family planning services.

Discussion

Our study showed significant gaps in knowledge, socio-demographic influences on attitudes, and inconsistent practices related to family planning among reproductive-age women in Bor South County, South Sudan. These gaps in family planning knowledge and socio-demographic influences align with similar challenges identified in other regions. For instance, our study's identification of knowledge deficiencies mirrors the substantial gaps reported in studies on cervical cancer screening among healthcare practitioners in Ethiopia and on emergency contraception knowledge among Egyptian healthcare practitioners. These consistent patterns across different studies underscore the widespread need for educational interventions to enhance family planning knowledge [9].

The study identified significant gaps in family planning knowledge among participants, highlighting a widespread lack of awareness regarding the range of available methods. These deficiencies are consistent with earlier studies in similar settings, such as those documenting gaps in cervical cancer screening in Ethiopia

and emergency contraception in Egypt [9]. However, this contrasts with findings from other regions where awareness levels are notably higher. For instance, in Sudan, 87% of women were aware of family planning methods, although challenges persisted in translating this knowledge into practice due to fears of side effects [21]. Similarly, in Egypt, 34.2% of women had good knowledge and 60.2% had a fair knowledge of family planning methods, indicating a higher level of awareness compared to Bor South County [22]. These findings suggest that while knowledge gaps are prominent in Bor South County, other regions with similar socio-economic challenges have managed to achieve better awareness. Addressing these gaps through targeted educational programs is essential to empower women with the information necessary to make informed decisions about their reproductive health, especially in resource-limited settings like Bor South County.

Attitudes regarding family planning in Bor South County were significantly influenced by socio-demographic characteristics like age, education level, and marital status. This work is consistent with past similar findings which noted that sociocultural factors greatly influenced contraceptive practices among the Juang tribe in India [6]. The influence of socio-demographic characteristics influences health attitudes [2]. They also highlighted the positive impact of training on enhancing family planning services among Nigerian chemists. These similarities emphasize the importance of customizing family planning treatments to suit the specific socio-demographic circumstances of the target populations.

The uneven practices related to family planning identified in this study are familiar to those that align with the findings of Vasconcelos et al., who found poor knowledge and use of pessaries among women [3]. Suwannarong et al. discovered significant gaps in implementing preventive practices concerning swine influenza among pig farm

stakeholders in Thailand [4]. These findings highlight the need for comprehensive educational programs that enhance knowledge, address misconceptions, and advocate for consistent and well-informed practices.

Socio-demographic barriers such as cultural perceptions and economic restrictions were found to severely hinder the utilization of family planning services. This is similar to the sin West Bengal, India, where socioeconomic factors affected the KAP of Rural Unqualified Health Practitioners [5]. Identified comparable obstacles were reported in Zimbabwe regarding the prevention of cervical cancer as well as in China concerning nutritional knowledge among pregnant women [11, 12]. Overcoming these barriers requires targeted interventions considering the affected populations' socio-economic conditions.

A study's findings show the need for targeted educational and outreach programs. Existing research supports the effectiveness of these programs. The training significantly improved the family planning services among community pharmacists in Nigeria [2]. Educational interventions were demonstrated to enhance KAP related to pesticide use among rice farmers in Iran as well as improve the awareness of dengue fever prevention in Yemen during the civil war [8, 10]. These examples demonstrate that well-designed educational programs can bridge knowledge gaps, correct misconceptions, and promote positive attitudes and practices.

Various constraints should be considered in this study. The cross-sectional design offers a momentary glimpse and cannot establish causality. The utilization of self-reported data may introduce response bias. Future research should employ longitudinal designs and incorporate qualitative methods, including randomized controlled trials, to identify effective strategies for improving family planning practices. However, while these strategies show promise, their effectiveness should be validated through further studies

before broad implementation. Analyzing the impact of local and national policies on family planning services is crucial to identifying gaps and opportunities for enhancing service delivery and access [20]. Engaging community members through community-based participatory research (CBPR) will ensure that interventions are culturally sensitive, acceptable, and effective for the target population [18]. Additionally, exploring the use of technology, such as mobile health (mHealth) applications and social media, can help disseminate family planning information and engage women of reproductive age, overcoming barriers related to geographic access and literacy levels [19]. Addressing these areas in future research will help develop more effective strategies to improve family planning knowledge, attitudes, and practices among women in Bor South County, South Sudan, and similar contexts.

Conclusion

The findings of this study highlight the urgent need for focused educational and outreach programs to enhance the KAP toward family planning among women of reproductive age in Bor South County, South Sudan. By overcoming socio-demographic barriers and enhancing community engagement, such programs can significantly improve the use of family planning services, ultimately resulting in improved maternal and child health outcomes in the region. These efforts should be informed by the lessons learned from similar interventions in other regions as documented in the existing literature.

What is already known on this topic

Knowledge, Attitudes, Practices, Family Planning, Women of Reproductive Age, Socio-demographic Factors, Bor South, Jonglei State, South Sudan.

What this study adds

This study adds the understanding of the Knowledge, Attitudes, and Practices of Family

Planning Utilization in Bor South, Jonglei State. The research will help the State MoH to design interventions; and inform decisions for improvement of family planning in the state.

Authors' Contributions

The author participated in, questionnaire design, data collection, data analysis interpretation and writing including drafting and approval of the manuscript.

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Competing Interests

The author declares no competing interest.

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